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A MANUAL  
of  
Artificial Respiration

Capt. G. R. G. FISHER

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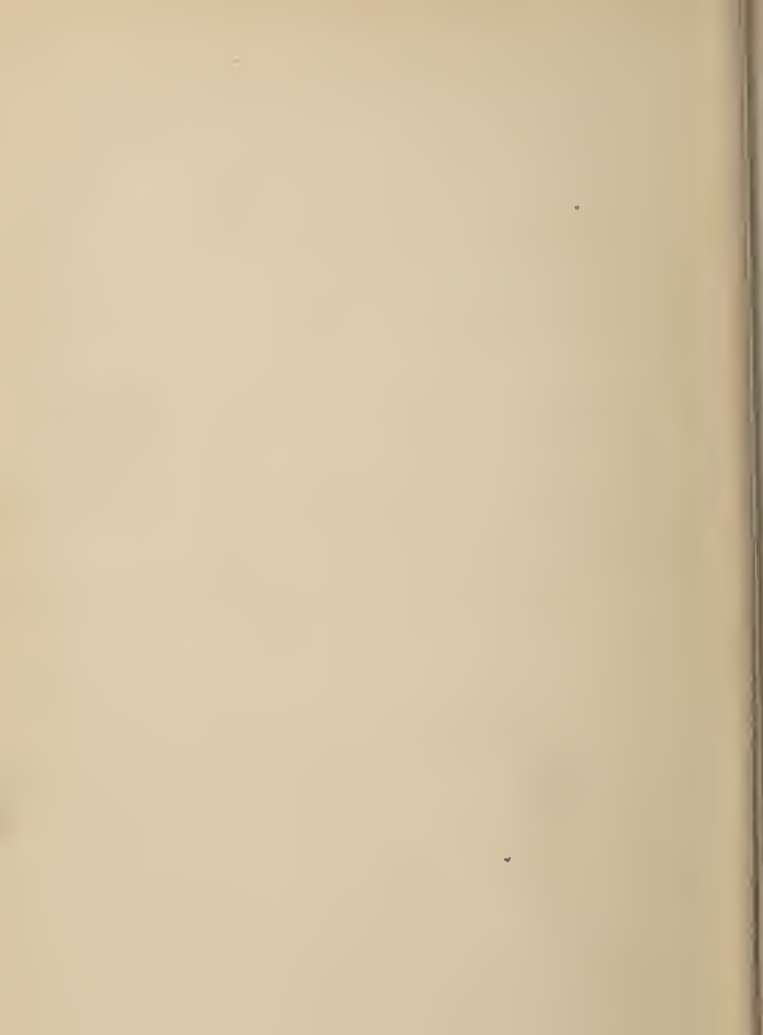
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A MANUAL OF ARTIFICIAL  
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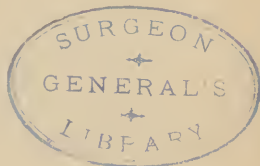
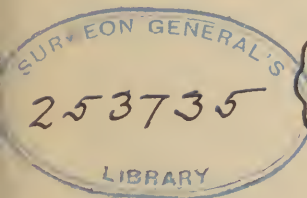
# A Manual of Artificial Respiration

What it is and How to Perform it to Resuscitate  
Those Included by That Class of Emergencies  
Which Cause the Victims to Stop Breathing and  
are Designated as "Apparently Dead!"

*Compiled by*

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## Dedicated

*to those of my fellow-mortals, who are employed Industrially, particularly those in electrical, telephone, gas making and mining hazards.*

*Also to policemen, firemen and life-guards, and to all who ought to know what to do in emergencies only too common.*



## Preface

NO APOLOGY is made by the author and compiler of this small and somewhat modest handbook, since it was conceived and born out of a conviction due to the urgency of dire necessity, through daily contact with a profession which emphasized only too keenly the appalling mortality entailed through a class of accidents, which, to treat properly, demands a working knowledge of *artificial respiration*.

Recent official U. S. mortality statistics show that about 10,000 lives are lost annually. Of these, about 6,000 are due to drowning, 3,000 to asphyxiation, and 1,000 to electrocution. If we add to these figures the 4,000 cases of suicides from drowning, asphyxiation and hanging — for many of these unfortunates are found before life is extinct — we are at once confronted with an appalling thought as to what this loss means to us as a Nation.

One of our great industrial surgeons, commenting upon our losses from such emergencies, has this to say: "If only the knowledge of artificial respiration were more generally known, especially among workers within the industrial world, thousands of persons which have been buried might be alive today!" In view of these words, is it saying too much that in all industries where these hazards exist to a greater

## Preface

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degree than in some others, that it ought to be the humanitarian duty, to say the least, that all such concerns ought to afford this positive instruction to their employees, so that any victim may be given this peculiar form of *first aid* so that these lives be saved.

If some corporations are doing this very thing, and if numerous victims are being snatched from the very jaws of death is attested by the fact, that at least 7/10 of all these successful cases of resuscitation reported are performed, not by doctors, but by the workmen themselves; it at once is an incentive to other concerns to do likewise and to all workmen to covet this most invaluable knowledge.

For who can tell when the occasion may arise, when a fellow man's life may be at stake, and how unspeakably worth while to be able to step in and thus ward off THE GREAT ENEMY, to say nothing of the joy of restoring that one to his or her loved ones.

Therefore there is the conviction that if the simplicity of the *Schaefer method of artificial respiration* in particular could be taught clearly, so that immediate action would be taken on such victims, who, in only too many cases are beyond hope through *the time lost* while awaiting the coming of him who may know what to do. It was this conviction which led the writer to frame this little manual in the hope and confidence that this very thing might be accomplished and thereby aid in the stemming of this awful tide of lost lives, of which, according to our insurance authorities, seven out of every ten lives lost ought to be saved.

## Foreword

**I**T IS axiomatic that the price of human progress is human life. Fortunately this price is not constant; the factors making it variable are many, but more prominently stand out the factors of *Sanitation, Disease and Accident Prevention and First Aid*.

This little manual by Captain G. R. G. Fisher succinctly and, at the same time, amply deals with one measure of First Aid to accidents so common to industrial life. The application of the principles and practices set forth herein will be a dependable factor in enormously reducing the present too high death toll claimed by accidents which attack the centers and functioning organs of respiration.

It is unmistakably destined to be of inestimable value in reducing mortality price of human progress.

DELMER L. DAVIS, M. D.,  
Dept. of Surgery, University of Nebraska.



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## CHAPTER I

### The Emergencies Which Demand *Immediate* Treatment By Rendering *Artificial* Respiration.

#### DROWNING.

ASPHYXIATION, such as from illuminating gas, mine gas, blast furnace gasses, sewer gas, coal gas, charcoal gas, etc. *Monoxide gas*, as the fumes thrown off from an oil stove in a bath room with its window and door closed, or a gas stove in a small room with little or no ventilation, or the exhaust from a gasoline engine in a small garage when the doors are shut. Dead air in a manhole, or one shut up in a bank vault, wherein he quickly consumes the little oxygen and is soon overcome by the carbonic acid gas he breathes out.

FUMES, such as in dense smoke, acid, ammonia, chloroform, ether, etc.

FUMIGATING AGENTS, such as formaldehyde, sulphur, etc.

NOTE—Scientists report that there are over 40 non-respirable gasses, any one of which, if breathed for a few minutes, will cause death.

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SEVERE ELECTRIC SHOCK, including lightning stroke.

CAVE-IN. This is usually quite serious, owing to the weight of earth material on the body.

POISONS, such as laudanum, prussic acid, strychnine, etc.

SUNSTROKE. In severe cases the hard rapid breathing may produce a clogging of lung action.

FREEZING. In extreme cases respiration ceases.

HANGING, GARROTTING, CHOKING from food.

KNOCKOUT BLOWS, as being "beaned" by a baseball, severe blows on the head short of a fractured skull, a blow at "solar plexus" or under jaw.

WINDED ATHLETES, as one exhausted from a grilling race, or one "knocked out" in a football game.

## CHAPTER II

What Actually Occurs in the Body of One to Whom Any  
of These Named Emergencies May Happen.

The average person thinks that all the breathing he or she does is carried on by the lungs, but, in reality, the most important part of the breathing function is that of *the diaphragm*, and, to some extent, even by the very pores of the skin. This fact was more than demonstrated some years ago in the south, when a little negro boy, who was selected to represent cupid, and whom they had beautified (?) with a coating of bronze paint, died from suffocation within two hours.

But let us deal a little at length with this little-known, and less understood muscle, *the diaphragm*. It is the muscular partition which divides the chest from the abdomen, the floor of the former and the roof of the latter. Its vital importance lies in the fact that, just as the heart is the organ of *the circulation*, so is *the diaphragm the organ of our respiration*.

If you will attentively watch one in a sound healthy sleep, you will be more than surprised to note that there is comparatively little movement of the chest, while that of the abdomen is quite conspicuous which rises and falls rhythmically 15 or 18 times a minute; *this is respiration.*

So then, let any one of these emergencies occur which we have named, and at once that which we call *the respiratory center* in the brain, which regulates the breathing, becomes temporarily paralyzed, and at once the diaphragm stops functioning; and following this, the lungs and the heart.

Perhaps you will now understand the commonly used term, "apparently dead." The victim is not really dead because he or she has stopped breathing, but they soon will be, *unless some one performs artificial respiration*, which is the one and only thing to do, and to continue it until the respiratory center in the brain is restored, and with it, those of the heart and the lungs. But is quite evident that this alone is possible to those who not alone understand these facts, but who also know how to perform this



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life-reviving movement; and to “carry on” the work patiently and hopefully — even though it may take many hours to obtain results.

## CHAPTER III

### What Others Have Done You Can Do.

Ponder these quite recent verified reports of some interesting cases of resuscitation and purpose in your heart to acquire this life-saving knowledge so as to be prepared against the any moment possibility of this emergency arising when YOU may actually be enabled to save a life.

A boy of 11 was drowned; his body was not recovered for fully 20 minutes. Two doctors awaited its being brought to shore; they carefully examined it, and pronounced the verdict that there was no hope. They covered the corpse (?) and went off to notify the coroner. All this time there stood by the chum of the victim — a boy scout — bitterly weeping at the thought of what had occurred. However, as soon as the doctors were out of sight he snatched off the sheet and, actuated by mingled feelings of despair and hope, proceeded to perform

artificial respiration, and within 45 minutes actually revived the dormant life.

A lineman of the ——— Power Company was “hit” by 2300 volts, and pronounced dead by an attending physician, who also withstood the pleadings of his mates, because as he insisted “there was positively no hope.” Nevertheless, despite his verdict, to the no less disgust of the physician, and even though they possessed but an elementary knowledge of the methods of resuscitation, they did what they thought should be done, and in about 35 minutes he was restored.

A baseball player in ——— Iowa was “beaned” and pronounced dead, yet because one of his team mates knew how to perform artificial respiration and who also insisted that they do not surrender his body until they had at least “tried to do something,” they made the effort. Within 45 minutes the “apparently dead” was upon his feet and led home with no little joy and satisfaction.

Perhaps one of the most extreme cases of which I have ever heard and one which certainly ought to have been hopeless, but which I dare to mention since it will prove an incentive to all my

readers so that they too "will take a chance." It is that of a lumber jack in northern Minnesota who fell through a log jam above a dam. They were nearly an hour in recovering his body, yet after four hours of persistent work, they actually restored him.

Please permit me to add "a word in season," on behalf of the medical profession, that when a doctor pronounces a verdict such as "beyond hope," "dead," remember that he is conscientiously acting upon the prescribed teachings of medical science; namely, that with the cessation of heart action, life is extinct. However, there are numerous surgeons — especially among those in the great industrial plants — who discard the stethoscope with all such victims, proceed to perform artificial respiration, and who pronounce the doleful verdict *only after all has been done which ought to have been done*. And for such as these, let us fervently "give thanks," and also pray that the Good God may increase their kind.

## CHAPTER IV

### How Does the Diaphragm Work?

First, permit me to say that this great muscle is attached to the lower ribs, which you can easily feel in your own body, though there are two "floating ribs" on each side lower down which are practically free of the diaphragm of which we shall speak later.

In answering the above question — when one breaths in, this great muscle practically flattens down (except at the front where the bottom of the breast bone can be felt, and where it is slightly concave.) This movement is called "*inspiration.*" When one breathes out, it rises dome-like on each side, a little higher on the right than on the left, which difference is due to the facts that the apex of the heart protrudes a little towards the left side and the liver ascends on the right side. Thus it rises and falls like pistons in their cylinders, about 18 times a minute; and this out-breathing is called "*expiration.*"

Now while you are reading these words, will you turn your thought in upon your own breathing and, in doing so, you will notice that you breathe more deeply *in* than you do when you breathe *out*; in other words, your *inspirations* are about *one-third longer than your expirations*. This is an important point to keep in mind when performing artificial respiration, which shows that the down pressure on the body of the victim ought not to be so long as the off-pause, when the hands are snapped off the body during the operation of the Schaefer movement.

## CHAPTER V

**To Know the Positions of the Organs of the Body, as also  
Those of the "Floating Ribs" is Vital in Performing  
the Schaefer Method of Artificial Respiration!**

It is probably safe to assume that most persons have studied an anatomical chart and that it might seem very unnecessary to waste time in specifying the location of the organs of the body, but long experience as a teacher of physiology compels me not to take things for granted.

The organs above the diaphragm in the chest are the lungs and the heart; those below are, on the right side, the liver; on the left side the spleen; in the front and extending well to the left, the stomach; and immediately behind and on either side of the spine, the kidneys. These all, in the main, are protected by the ribs, save part of the stomach at the immediate front, which is known to most people as the region of the "solar plexus."

Now, strange to say, at the lower parts of these organs, to the immediate right and left, lie

the 11th and 12th pair of ribs known as the "floating ribs;" just as if the All-wise Creator had purposely placed them there that they might act as springs, so to speak, to the bellows we are to work in performing this wonderful Schaefer movement, which, without question, is the most effectual method of artificial respiration.

Consequently, when you straddle the body of a victim, placing the hands as will be described and illustrated later, the downward pressure with rigid arms and inward pressure with fingers causes these organs to force up the diaphragm and when this pressure is released by the snapping off of the hands, the ribs spring back, the diaphragm descends, creating a vacuum which compels the air to rush in; so much so, that one usually hears a gasping sound from the victim.



## CHAPTER VI

Since the Methods Most Commonly Used Are the  
"Sylvester" and the "Schaefer," Possibly the Follow-  
ing Comparative Chart Will Prove of Some  
Interest by way of Visualizing Their  
Respective Points.

### SYLVESTER

Position of victim—on back.  
Tongue of victim must be held so that it may not fall back over trachea.

If a drowning case, water can not escape.

Movement calls for 2 or 3 persons.

Victim's arms have to be used in the movement, therefore laborious.

Amount of air inspired and expired by the victim in this method is 175 c. c. (spirometer measurement)

In severe electric shock cases, the muscles of the chest, shoulders, and the arms are usually rigid, hence but few resuscitations are obtained; about 3 in 10.

### SCHAEFER

Position of victim—on face.  
Victim's tongue when once brought forward remains so because of position.

If a drowning case, the water will ooze out freely.

One person can carry on alone.

Pressure is at the small of the back with arms rigid, hence easy on operator.

Amount of air inspired and expired by the victim in this method, is 520 c. c. (spirometer measurement).

NOTE—the advantage of this method in electric shock is only too evident; indeed, it is said that the very pressure made by this movement, actually helps to ease up this muscular tensity. Resuscitations obtained 10 in 13.

## CHAPTER VII

There Are FOUR Positive Steps Which Must be Taken  
Before the Actual Movement for Resuscitation is  
Started, the Neglect of Any of Which May  
Spell Failure for the Operator and Burial  
for the "Apparently Dead."

*First Step.* Loosen all tight clothing, especially at neck and waist.

- a. A man's collar, and the suspenders over shoulders.
- b. A man's belt and trouser band.
- c. A woman's skirt bands and corsets.

NOTE—Any tight waist clothing will positively impede the free movement of the diaphragm, the attachment of which is at the waist line.

Study the accompanying cuts of these four steps.

*Second Step.* Turn the body of the victim over, face down; stand over it astride, clasping the hands under it at about the pit of stomach, jerking it up and holding it there for a few moments by bracing the elbows on the thighs. If the case is one of drowning, hold the body up a

ILLUSTRATION No. 1



First Step

ILLUSTRATION No. 2



Second Step

little longer so as to allow the water in the stomach and breathing passages to drain out. If a suffocation case, this jerking up of the body will help to clear the air passages and in such cases to do it two or three times will be helpful. If the victim is a large heavy person, have some one assist in the lifting process by clasping hands while facing each other at opposite sides. Study illustration No. 2.

*Third Step.* Open the mouth, use a clean handkerchief or piece of gauze; insert one or two fingers; pull the tongue forward; remove any obstruction from mouth such as loose false teeth, tobacco or chewing gum; if there is none of these, there is usually some mucus. Of course the jerking up of the body does much to effect this very thing, especially in drowning; nevertheless, it is important that this step be taken so as to make quite sure that everything is clear. See illustration No. 3.

*Fourth Step.* Stretch victim's arms straight out above head; flex left forearm, supporting head thereon, with the face turned to the right,

ILLUSTRATION No. 3



Third Step

ILLUSTRATION No. 4



Fourth Step, and *first position* in performing Schaefer Method

but see that there is no outside obstruction in the way of the mouth. (This fourth step is only used when performing the Schaefer movement.) See illustration No. 4.



## CHAPTER VIII

The Schaefer or "Prone" Method of Artificial Respiration, and How to do it Correctly for Successful Resuscitation—Following Instructions as to  
*the Four Necessary Steps.*

Proceed as follows:—

*First.* Straddle the body by kneeling a little above the victim's knees (a woman operator can spread the legs of the victim and kneel between) ; this position is positively necessary, since in this way only can equal pressure be made to cause the diaphragm to function successfully.

*Second.* Place the hands with thumbs close to the fore-fingers on the small of the victim's back, immediately above the hip bones, with the finger tips out of sight. Make the arms rigid and throw the weight of your body forward with steady pressure—there must be no jerking—and, as this is done, squeeze in with the fingers thus forcing in the floating ribs.

While making this downward pressure, count deliberately— one — two, then snap the hands

ILLUSTRATION No. 5



Second position in performing the Schaefer Method

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off the body onto the ground, continuing to count — three — four — five, and resume the movement as above; thus carrying on until resuscitation is achieved. Study illustrations Nos. 5 and 6.

NOTE—The entire movement should not be less than five seconds, so that about twelve movements will be rounded out to the minute. This is the rate suggested by those who have had much experience in reviving the "apparently dead." An aid could time the operator by holding a watch and calling the periods.

ILLUSTRATION No. 6



Third position in performing the Schaefer Method. Hands snapped off body.

## CHAPTER IX

As it is Quite Possible That in Some Instances the "Sylvester" Method Might Have to be Used, the Following Rules Ought to be Held to Faithfully if Success is to be Obtained. But of Course the Preparatory Steps Must be Taken Prior to the Movement Itself.

Proceed as follows:—

*First.* Place the victim on back, preferably on a bench so that there will be more freedom in the movement; have an aid hold the victim's tongue out, a small wooden paper clip or piece of gauze will do for this purpose.

*Second.* Grip the victim's forearms close to the elbows, swinging outwards for the upward movement, doing so slowly while counting — one — two — three, this for *inspiration*. Then swing arms quickly back to the lower edge of ribs and press in strongly with the victim's elbows. This movement should equal about two moderate counts; this is *expiration*.

NOTE—As an aid to the success of this movement, the helper who is attending to the victim's tongue, may also hold a cloth to the nose on which a little aromatic spirits of

ILLUSTRATION No. 7



Inspiration movement in Sylvester Method. The lady assisting is ready with clenched fist to press in at pit of stomach, when the operator brings victim's arms down. The boy has a cloth with aromatic spirits of ammonia on it to hold to nostrils in this motion.

ILLUSTRATION No. 8



Expiration movement in Sylvester Method. The lady assistant quickly removes fist as soon as Operator strikes lower ribs with victim's elbows.

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ammonia is poured, while the inspiration movement is being executed—but only for a moment. Further, he may also work the tongue in and out; a 'Laborde style, i. e. **In for inspiration, and out for expiration.** Another helper can be of much assistance by kneeling at the victim's side and, with clenched fist, press in sharply at pit of stomach when the operator's hands are brought down for the expiration movement; thus producing a more positive stimulating effect upon the heart. This is a part of the method known as the "Howard."

Study illustrations Nos. 7 and 8.



## CHAPTER X

### A Few General Rules to be Observed During the Application of Artificial Respiration.

1. Always send for medical aid, but do not wait for his coming, minutes are as hours in these cases; proceed as has been suggested.

2. If cold weather, cover the body with a blanket; apply hot water bottles to the feet and sides — *see that they are not too hot to burn.*

3. In all cases of asphyxiation — *except by ammonia fumes* — use aromatic spirits of ammonia to the nostrils momentarily while inhaling.

4. Always provide abundance of fresh air, which means that if there is any crowding of spectators, that they be kept well back from the victim.

5. When signs of reviving show themselves, have the helpers begin to rub the limbs towards the body; occasional slapping of the bare soles of the feet, or striking with a small club over the soles of the shoes is often helpful.

6. If when applying the Schaefer method, the face becomes congested, quickly change over to the Sylvester, but see that the body is kept on a slant — head slightly higher; when congestion disappears change back to Schaefer position.

## CHAPTER XI

Some Vital "*Dont's*" to be Rigorously Kept in View  
When Artificial Respiration Has to be Given.

1. DON'T wait, not under any circumstances; if the body is where you can work on it, *do it, and do it right away.*

2. DON'T stop the application of the Schaefer method to permit the use of a pulmotor or lung-motor, unless you know that the apparatus is actually in working order; and that, too, it is *in the hands of a trained operator.*

3. DON'T surrender the body to an ambulance unless you can accompany it and continue the movement enroute to the hospital. When this is permitted, there is usually a funeral, *i. e.*, short of the movement enroute.

4. DON'T desist, even if a physician pronounces the victim "dead;" there are so many cases in which this has been done, where, in the face of the verdict, a persistence in continuing the movement has won out. No sane doctor will

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resist you and all the friends of the victim will back you in your efforts, while, as for the relatives in their despair, nothing need be said.

5. DON'T allow the chafing of the limbs, until there are signs of reviving; it is rather questionable since it has the tendeney to push the blood back on the heart, which is dormant until revival sets in. There is an exeption however to this rule — see chapter 13 “illuminating gas.”

6. DON'T turn the vietim over on his back at first signs of reviving (when Schaefer method is used); be patient and only do so when the lung action shows up positively. When turned over, continue to keep the hands on the lower ribs to assist the labored breathing. See that the vietim is in a reeling position; he will breathe easier this way.

7. DON'T allow the spectators to crowd in when he is reviving, that is, when necessary, insist that they be made to get away off, and especially permit no hysterical relative to come near him until he is getting well back to normal.

8. DON'T be too eager to give liquids, give

him a chance to breathe freely before this is attempted. When a stimulant can be given without fear of choking him, see that it is something hot, such as tea, coffee, or what is without question the best possible stimulant, *aromatic spirits of ammonia*,  $\frac{1}{2}$  a teaspoonful in  $\frac{1}{2}$  a glass of hot water; feed it to him in a spoon by sips.

9. DON'T fail to watch him for hours after he is revived; it is not beyond the possible for him to stop breathing again and, in that case, go at it again. In such instances the victim quickly responds. A heart stimulant in the line of a hypodermic injection by the doctor will work wonders.

## CHAPTER XII

### The Pulmotor—Some Facts to Keep in Mind in Reference Thereto.

Most industrial surgeons condemn this method of mechanical resuscitation.

One such authority has this to say relative to its use: "Since the introduction of the pulmotor, thousands of persons have been buried that ought to be alive today." It may be that his conclusions are based upon the three reasons which I like to give *for not using it*.

1st. It is not always at hand, and to wait for it is fatal.

2nd. It may be out of order, and to use it, if such is the case, must prove fatal.

3rd. If used by other than a trained operator, it is a risk which may also turn out fatally.

So then the moral is clear, do not depend upon that which might prevent the resuscitation of the victim, but go to it and use your hands (which are always with you), just in the manner which

we have tried herein to make clear to you; *and by all means stick to the Schaefer method.*

It will be of much interest to my readers, as it was to the writer, to learn from the pages of a government report devoted to the investigations of a select committee upon this subject of resuscitation of these victims, *i. e.*, Technical Paper No. 77, Bureau of Mines, 1914, p. 25. Two very startling objections are therein raised in reference to the use of a mechanical apparatus such as the pulmotor.

*First.* "It is possible when using a mechanical apparatus *to turn inspiration into expiration through a slight resistance in the air passages of the victim.*"

*Second.* "That the expiration (breathing out) movement by suction, as in the pulmotor, is very harmful."

I take time here to recall to the reader's mind what we endeavored to show as to the movement of the diaphragm; that is, in normal respiration, expiration is produced by muscular contraction. Hence the conclusion reached in the above quoted report is, "that the automatic

mechanism of the pulmotor, though an ingenious technical contrivance, instead of assuring artificial respiration, may interfere greatly with its efficiency, because the mechanism is likely to cut off inspiration prematurely."

This government report strongly commends the Schaefer method of artificial respiration.

While representing the Bureau of First Aid of the American Red Cross at the South Dakota State Fair, just before the World War, I was giving demonstrations in first aid to very large crowds whose interest was most compelling. In these demonstrations artificial respiration was one of the most vital elements emphasized and, as is my custom, I had warned my hearers as to the pulmotor (as per my threefold objections.) One day as I closed the demonstrations a gentleman accosted me, introduced himself and said that he represented the U. S. Department of Mines. He took occasion particularly to compliment me upon the demonstration in resuscitation and added, "what you said about the pulmotor was most timely and I wish to state a fact which I shall be glad if you will be good enough to repeat in connection with your re-



marks on the pulmotor. It is this; in most cases where the pulmotor is used, if the victim is not revived, the post mortem usually reveals that the lungs are a mass of blood, *the pulmotor having ruptured the lung tissue.*” I am sure that you can now grasp the significance of the government report, especially in the light of the shocking fact stated by this officer of the Bureau of Mines; the connection is clear, “it is possible with a mechanical apparatus to turn inspiration into expiration.” In conclusion, as far as this subject is concerned, hold to the use of the hands, and especially through the Schaefer method, in the application of which you are at least positive that, if you do not accomplish any good, you certainly will do no harm; and yet, in the bulk of such cases, providing that the conditions are right, and that you follow the suggestions herein given, success ought to crown your labors.

## CHAPTER XIII

The Particular Things to do, in the Particular Emergency Which May Demand its Own Peculiar Treatment, Which if Followed Would Secure Speedier Results.

### IN CASE OF ELECTRIC SHOCK

The question of high or low voltage in this matter of electrocution is rather a puzzling one. A good authority on this subject cites the case of a man who, while taking a bath, reached up to turn on the light, and who received sufficient shock to effect him for several days—*the voltage was only twenty-seven*. Quite recently a lady while taking a bath, in some manner overturned a small electric heater into the tub. Upon the arrival of the physician he pronounced her dead — though no effort was made to resuscitate her. The voltage was 110.

In contrast with these we have cases of electric power linemen being “hit” with as high as 6600 volts and actually being revived. Some authorities lay this fact to the higher voltage seemingly

only affecting the body surfaces; they name it "skin effect." However, whether "high" or "low" let us not waste any time in debating the matter, especially in the light of one case where a lineman was "hit" by such high voltage and fell 30 feet. Even though his left hand was burnt off and the arm charred to the shoulder, still his mates actually revived him.

Of course if the victim is in contact with "a live wire," the first work will be that of removing him from that predicament; but you must think of your own safety; if you do not, there will be two in the same fix and you will be one of them. Either "short circuit" or sever the wire on the side from which the current is coming, or have the current cut off; but whatever you do, follow "safety first" rules.

If a victim is "hit" on a pole or a cross-arm and does not fall, tie a bowline around chest under arm-pits and lower to ground. If you do not have a rope, tie the hands together, putting your head and one arm between, thus getting him on your back. In that way one can easily bring him down to the ground. See this illustrated in chapter on transportation.

If the victim is "hit" in a bath-tub, first cut off current, or remove wire from the water or contact with tub (if it is metal) with a dry stick. Then get him out of the water and proceed to resuscitate.

In all cases of electric shock, if the victim does not fall at least ten feet when "hit," you must administer COUNTER SHOCK.

Victims of severe electric shock who fall have always been easily revived, and the medical world, especially the industrial, have decided that this falling of the body is the "saving clause," inasmuch as it imparts a "counter shock" and thereby reacts upon the temporary paralyzed respiratory nerve center in the brain, which makes possible speedier resuscitation—especially when the Schaefer method is employed. Numerous cases of those thought to be electrocuted, whose bodies were put into vehicles for conveyance to some undertaking establishment, have been revived by the very jolting of the machine.

Here is one practically fresh off the press:—Omaha Bee, September 6th. "Man thought dead, screams in hearse." This victim was

“hit” by a live wire, pronounced dead by a physician, no effort made to resuscitate, undertaker called, *the corpse* (?) was put into the hearse and, on the way to his home, the jolting brought him to. That’s all and it is laughable, but when one considers the distressing fact of the many such victims who are not only pronounced “dead” but in time actually buried, who ought to have been revived, what shall we think of the ignorance which is responsible for these tragedies?

Indeed it is a mild form of culpable homicide, on the part of those who stand by and consider a victim dead who is in point of fact only “apparently dead,” but who will soon be dead and ultimately buried, if the bystanders, whether medical or lay, *do not know how to render artificial respiration*.

How then is “counter shock” administered? While the operator is going on with the resuscitating movement two helpers should kneel at the feet of the victim, one on either side who, at intervals of say half a minute, lift up the foot of the victim and hit smartly right over the sole of the boot ’twixt heel and toe, with a hammer

ILLUSTRATION No. 9



Method of administering "Counter Shock"

handle or the "climbers," taking care to sustain weight of limb so that the knee is not on ground when the blows are administered. If the shoes are off, spank sharply with the hand, a paddle or anything which is narrow and flat. This then in how "counter shock" may be given if the body does not fall ten feet or more. Study illustration No. 9.

In a recent case of severe electric shock treated by the linemen of the Nebraska Power Company and revived in 35 minutes, the men reported to me that, in addition to the hitting of the soles of the shoes with their climbers, they found that they made more positive progress by pausing in the movement two or three times to jerk up on the victim's abdomen (step No. 2).

NOTE—In all cases of severe electric shock, because of the fact that the "juice" causes the muscles of the shoulders, chest and arms to become tense or rigid; it is NOT possible to get results if the Sylvester method is used; therefore always resort to the Schaefer or prone method.

Study illustration No. 9 for the method of giving "counter shock."

NOTE—The Nebraska Power Co. of Omaha, reports that it is not uncommon for a victim who has suffered from low voltage shock to have violent convulsions when coming out of the dormant stage. If the surgeon is present a hypodermic injection is administered to relieve the pain. It is evident from this, that the low voltage must go to the heart, probably

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that helps to explain why it is more difficult to resuscitate these cases; while those suffering from the high voltage (especially if the victim falls) are revived within a few minutes. But let no one despair in performing artificial respiration on one who may be "hit" with low voltage. Use the Schaefer method and follow these instructions herein given; since they are the tried methods which have proved successful in numerous cases and they will always bring results—provided there is a ghost of a chance.

### IN CASE OF DROWNING

If the body is taken out of the water some distance from shore, at once follow STEPS 1, 2 and 3. Place the victim on his back over the thwart or seat of the boat and apply the Sylvester method, while others are pulling ashore. This is the only method which one could use in this peculiar instance, and is at once a strong reason for a working knowledge of this method of resuscitation also. When on shore, however, I should resort to that of the Schaefer method.

NOTE—Don't try to apply any method if you are in a canoe; quickly get the body to shore and there set to work.

### IN CASES OF ASPHYXIATION FROM ILLUMINATING GAS

If the victim lies in a closed room, endeavor to have the gas shut off at the meter, and, if it is necessary, break the windows so as to let in air; lots of it is vitally necessary. In all cases, get



the victim out into the open air, but avoid this *if it is frosty*; in that case seek a moderately warm room. In slight cases, where they are not entirely overcome, give a goodly draught of *effervescing phosphate of soda*, if you can get it; by all means induce vomiting; keep them walking, and while doing so, have some one hold a cloth to their nose upon which aromatic spirits of ammonia has been sprinkled — but don't hold it too long at a time as it will be apt to suffocate them.

If helpless but still breathing turn over on stomach, jerk up on clasped hands under pit of stomach (step No. 2). Do this two or three times, as this will help rid the air passages of any gas; hold aromatic spirits of ammonia to nostrils; and, as soon as it is possible for him to swallow, give the effervescing salts. Try to induce vomiting. When he is able to stand, assist him to walk up and down.

If the victim has stopped breathing, rush medical aid and proceed as has been suggested for the work of resuscitation. But in addition, apply heat to the body, have the muscles of the limbs

vigorously rubbed, as such friction is a decided help in these peculiar cases.

NOTE—This is the one exception in performing artificial respiration, where rubbing of limbs should be permitted before the victim revives; in this case it is really friction to help relax the muscles.

In many gas plants, oxygen is kept on hand for the treatment of such cases and hypodermic injections are administered. In the hospital treatment, much success has been achieved by the use of normal saline solution and even by blood transfusion in the saving of these victims.

#### IN THE CASE OF ONE OVERCOME BY GASOLINE FUMES

First get the victim up off the floor and into the fresh air, as the fumes are heavy and hug the ground. Even if he is not quite overcome turn him face downwards and clasp hands under the abdomen and jerk up two or three times to help rid the air passages of fumes. If you can induce vomiting, that will be even better than the jerking up method. Use plentifully aromatic spirits of ammonia for inhaling, and when able to swallow give some internally —  $\frac{1}{2}$  teaspoonful in

1/2 glass of water. If entirely overcome follow the general rules for reviving, preferably by the Schaefer method.

IN CASES OF HANGING OR CHOKING FROM  
FOOD, ETC.

If strangulation from food, bend the body forward; slap hard on the back. If that does not discharge the mass, run the finger around the outside of back teeth, and in that way you may succeed in getting the finger behind it and thus eject it. If the victim stops breathing, quickly remove the obstruction, and proceed to perform artificial respiration.

If hanging, and you discover that the victim has not hung for more than say twenty minutes, and that there is no evidence that the neck is broken (most cases of this nature merely strangle to death), get help, cut the body down, jerk up on the stomach as in "step No. 2," and at once proceed with the artificial respiration movement. If after faithful and persistent effort you do not succeed, then call for the coroner.

NOTE—According to the dictates of the Law you are supposed to first call the coronor, but that would mean loss of time, therefore FIRST try to resuscitate if there is but a ghost

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of a chance; and if you should succeed, even the Law will commend you for your ignoring its mandate. Even the poor mortal whom you snatched from the jaws of death may have good cause to be grateful also.

### IN CASE OF AMMONIA ASPHYXIATION

Quickly remove the victim from the area of the fumes; it is quite possible that to do this you may have to crawl on your hands and knees to where he is. In that case soak a handkerchief in vinegar or diluted acetic acid, tying same over your nose and mouth; this will enable you to breathe in the midst of the ammonia fumes.— See chapter on transportation for methods of rescuing.

When you have him at the place where the air is good, proceed with the general rules of resuscitation. But instead of using aromatic spirits of ammonia—*this is the exception to the rule*—in these cases you substitute a cloth soaked with good vinegar or diluted acetic acid, and see that it is so held to the mouth and nose that he inhales its fumes. Ammonia is a strong alkali and must be overcome with a weak acid as suggested.

When he is revived and can swallow, a good stimulant would be a cup of hot lemonade.

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### IN CASE OF SUFFOCATION FROM SMOKE OR ACID FUMES

Get the victim out into the open air; try to induce vomiting—this is the method usually practiced by firemen who are so effected. Hold a cloth with aromatic spirits of ammonia to the nostrils so that he may freely breathe it; when able to swallow give  $\frac{1}{2}$  teaspoonful in  $\frac{1}{2}$  cup of water. If entirely overcome, proceed with artificial respiration as per the rules given.

### IN CASE OF PRUSSIC ACID POISONING

The action of this poison is exceedingly rapid, unconsciousness usually setting in within two or three minutes; and one of the distressing symptoms is that of the swelling of the throat causing suffocation.

If possible quickly neutralize the effect of the poison by getting the patient to rinse out mouth and gargle throat with an alkali, *i. e.*, pure alcohol, lime water or a mixture of strong saleratus water; and have him also slowly swallow some. Hot cloths should be applied to the neck, especially to the windpipe; also give

chipped ice to suck; in this manner the swelling may be reduced. If there is difficulty in breathing he may be materially aided by performing artificial respiration and since it will be easier for him to remain on his back, resort to the Sylvester method.

NOTE—Whatever causes a swelling of the tissues of the throat, always resort to the use of hot applications to the throat say from the top of the breast bone to the chin and around the neck, also give chipped ice to suck; and olive, sweet, or any good oil may be given in dessert spoonfuls. Often a bee sting, particularly at the temple produces these symptoms. Remove sting and follow this treatment.

## CHAPTER XIV

Transportation, or the Knack of Handling the Injured,  
Helpless or the "Apparently Dead"—by  
"One Man" Methods.

All persons, especially those employed in our industries, particularly where the "hazards" exist, ought to know how to be able to take proper care of their fellows when taken by some emergency, to the extent of their either assisting, or lifting, or carrying them. This whole matter of so doing is just "a bit of science," and these instructions, together with their accompanying illustrations, will make it easy for the reader to acquire the knack—if only he will practice them a little.

1. *The Assist* is the easiest method of helping one either with an injured ankle or knee, or in the case of one being shakey from gas, fumes, etc. Be sure to hug the patient close to you. See illustration No. 10.

2. *The Coat Carry*. If the patient can stand just long enough so that a few turns to the tail

ILLUSTRATION No. 10



The Assist



ILLUSTRATION No. 11



The Coat Carry—*First Movement*

ILLUSTRATION No. 12



The Coat Carry—*Second Movement*

ILLUSTRATION No. 13



The Hip Carry — *First Movement.*

ILLUSTRATION No. 14



The Hip Carry—*Second Movement*

ILLUSTRATION No. 15



Fireman's Lift—*First Movement*

of his coat can be given, then turn quickly, bringing the twist well over on to your shoulder, then stoop, pulling tightly so as to have him well up on your back; and in that manner you will easily carry him. Be sure that you bend your body well forward in lifting and carrying. Study illustrations Nos. 11 and 12.

3. *The Hip Carry.* This is another quick method of carrying one out of a dangerous place — providing you can get him to stand while making the hold. Stand to the front of the patient, run your hand over the near shoulder, around the neck, catching him under the further armpit, stoop down with bent knees, catch your free hand around the patient's limbs; and lift over onto your hips. Follows illustrations Nos. 13 and 14.

4. *The Fireman's Lift.* Without question, this is the best of all methods to lift and carry the helpless or unconscious. It is not a question either as to size or weight, providing you do it as illustrated. Roll the patient over face down, lift him by his armpits on to his knees, clasp him around the body in a tight embrace and rise,



Fireman's Lift—*Second Movement*



Fireman's Lift—*Third Movement*





Fireman's Lift—*Fourth Movement*

bringing him to his feet. As you do this, place your left knee against his knees so as to keep him erect. Hold him tightly with the left arm, grip his left wrist, stoop so as to thrust head under the left arm, pulling the body over your back with the bend of his body pressed against your shoulder, at the same time drop the left hand over the buttocks to about the knees. Then brace yourself thoroughly for the lift and, as you rise, pass his left hand to your left, grasping strongly at the wrist; and if he is not quite well balanced upon your shoulder throw his body into correct poise by a hitch of your shoulder.

NOTE—The firemen always place the lifting arm between the legs. They do so as to bring the body across the shoulders and that the feet will be out of the way of the ladder in descending. But for surface work the above is by far the best as it gives one a more secure hold of the body.

Study illustrations Nos. 15, 16, 17 and 18.

5. *The Back Crawl Carry.* This method will be found very useful in rescuing a victim from a gas-filled room, or where fumes demand great care on the part of the rescuer.

If smoke with acid fumes or illuminating gas, wet a handkerchief with diluted aromatic spirits of ammonia; if ammonia fumes, wet with good

ILLUSTRATION No. 19



*The Back Crawl Carry—Movement One*

ILLUSTRATION No. 20



The Back Crawl Carry—*Movement Two*

vinegar and tie over mouth and nose, then when you near the point for the dash to reseue, get down on hands and knees so as to avoid the fumes, because the air is purer near the ground. When you reach the vietim see that he is on his back, quickly tie his hands together at wrists — be sure you tie a square knot. Lie on him face up, bring his tied hands over your head, grip his pants tightly at either hip, holding taut. Roll over onto your chest, this movement will bring him on to your back and under him. Spread his legs so that they will hange one on either side of yours; then rise to your knees and crawl back to where the air is good and there finally rising to your feet so that you may run to safety. Study illustrations Nos. 19, 20, 21 and 22.

NOTE—With this “carry” the rescuer may descend a ladder or fire escape, providing that when he rises to his feet that he thrust one arm through the (bight of) the vietim’s tied arms: this will prevent the possibility of his arms choking one as his weight hangs on the neck.

As a further word of exhortation,—be sure that for all reseue work where it is necessary either to use a rope in lowering a body, or to tie the hands as in this latter “carry,” that you

ILLUSTRATION No. 21



*The Back Crawl Carry—Movement Three*



The Back Crawl Carry—*Movement Four*

know how to tie *a bowline with a rope* for the former, and *a square knot* for the latter. And be sure that you can even do it in the dark, so that you do not endanger your victim whom you are trying to rescue. A “granny knot” will not hold, and a slip knot tied with a rope around a man’s body, owing to his own weight, may cause injury of a serious nature.







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